



UNITED STATES PATENT AND TRADEMARK OFFICE

gmu
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,497	09/26/2003	Paul A. Farrar	M4065.0402/P402-C	8623
24998	7590	06/29/2004	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			VU, DAVID	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	
			2818	

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/670,497

Applicant(s)

FARRAR, PAUL A.

Examiner

DAVID VU

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 76-83 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 76-83 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>09/26/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. On page 17, line 1, it appears that the line item "57a" should read as --55a-- which is the fourth intermetal insulating layer shown in FIG. 17.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2818

4. Claims 76, 77, 80, 81 and 83 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 76, 77, 80, 81 and 83 contains the trademark/trade names SILK, and NANOGLASS. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S. C. 112, second paragraph. See Ex parte Simpson, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade names are used to identify/describe low dielectric constant layer and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 76-80, 82 and 83 are rejected under 35 U. S. C. 102(e) as being anticipated by Hasegawa et al. (US Pat. 6,593,246, herein after Hasegawa).

Regarding claim 76, Hasegawa discloses an integrated circuit structure, comprising: a SILK insulating layer 13 (col. 6, lines 8-25) provided over a semiconductor substrate 11 and contacting at least a portion of a metal layer 53 provided within semiconductor substrate 11; a NANOGLOSS insulating layer 14 (col. 8, lines 24-30) provided over SILK insulating layer 13; and a first opening within SILK and NANOGLOSS insulating layers (fig. 3F).

Regarding claim 77, Hasegawa discloses that the first and second dielectric (13/14) can be "repeated" such that a third and fourth insulating layers with a dielectric constant lower than 4.0 are necessarily provided over NANOGLOSS insulating layer 14; and a second opening within third and fourth insulating layers (col. 10, lines 20-26).

Regarding the limitation that the opening being formed by time etching of at least one of SILK and NANOGLOSS insulating layers with an etch chemistry (claims 76 and 77), such limitation does not further define the structure as instantly claimed, nor serve to distinguish over Hasegawa. Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product

produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw make clear.

Regarding claim 78, Hasegawa discloses third and fourth insulating layers are formed of different materials which can be selectively etched relative to each other (col. 10, lines 20-26 and col. 9, lines 43-47).

Regarding claim 79, Hasegawa discloses third and fourth insulating layers comprise organic material (col. 6, lines 18-25 & 37-39 and col. 7, line 33 through col. 8, line 24).

Regarding claim 80, Hasegawa discloses organic material is selected from the group consisting of polyimide, spin-on-polymers, flare, polyarylethers, parylene, polytetrafluoroethylene, benzocyclobutene and SILK (col. 6, lines 18-25; lines 37-39 and col. 7, line 33 through col. 8, line 24).

Regarding claim 82, Hasegawa discloses third and fourth insulating layers comprise inorganic material (col. 6, lines 29-35 and col. 8, lines 24-30).

Regarding claim 83, Hasegawa discloses inorganic material is selected from the group consisting of NANOGLASS (col. 8, lines 24-30).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 81 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Hasegawa et al. (US Pat. 6,593,246) in view of Baklanov et al. (US Pat. 6,593,251, herein after Baklanov).

Hasegawa does not disclose fourth insulating layer comprises organic SILK material and third insulating layer comprises inorganic NANOGLOSS material but rather that the third and fourth insulating layers are generally organic 13/inorganic 14 (col. 6, lines 18-25 & 37-39 and col. 8, lines 24-30) or inorganic/organic (col. 4, line 65 through col. 5, line 2) respectively.

Baklanov discloses that NANOGLOSS is a suitable inorganic dielectric (col. 3, line 20) and SILK is a suitable organic dielectric (col. 3, lines 16-17) for the Inter-Layer Dielectric applications described by Hasegawa. It would have been obvious to one of ordinary skill in the art at the time the invention was made to chose NANOGLOSS and SILK as the third (inorganic) and fourth (organic) insulating layers in Hasegawa device because these materials have a low dielectric constant and have the properties required by the teaching of Hasegawa. The motivation for specifically picking NANOGLOSS and SILK as the inorganic and organic dielectric layer is that such materials have a low dielectric constant such that parasitic capacitance between conductors is reduced.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Vu

June 24, 2004